DOCUMENT RESUME

ED 223 438 SE 039 597

AUTHOR Rakow, Steven J.
TITLE The "Marinated" Classroom. A Sourcebook of Aquatic Activities for the Elementary Classroom.
INSTITUTION Minnesota Univ., Minneapolis. Minnesota Sea Grant Program.
SPONS AGENCY National Oceanic and Atmospheric Administration (DOC), Rockville, Md. National Sea Grant Program.
PUB DATE 82
NOTE 51p.; For related document, see SE 039 598.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052) -- Reference Materials - General (130)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Biological Sciences; Elementary Education; *Elementary School Science; *Environmental Education; Instructional Materials; Interdisciplinary Approach; Language Arts; Learning Activities; Resource Materials; *Science Activities; Science Education; Social Studies; *Water; Water Quality; *Water Resources
IDENTIFIERS *Aquatic Life; Freshwater Systems; *Minnesota

ABSTRACT

This handbook is designed to meet the aquatic education needs of Minnesota elementary teachers and students (aquatic education referring to the study of freshwater systems). The handbook is divided into three parts. Part 1 (an introduction) provides an overview of aquatic education, a description of the use of the handbook, and two indexes to curriculum materials (defined as instructional materials providing ideas or plans for water-related activities). These materials include either complete courses of study or short collections of activities. The first index lists curriculum materials by source, with full references for requesting them by mail. The second index lists the curriculum materials by their Minnesota water topic area. Topic areas include: water and society (water in daily lives, water in history and culture, water quality problem); water in nature (water cycle, properties of water, life in water); and attitudes about and experiences with water. Curriculum materials are listed alphabetically by title in the second part and include for each entry: source, price, grade level, subject area(s), student prerequisites, time required, and other information. The last part provides an annotated list of student/teacher references. These include trade books, bibliographies, pamphlets, and audio-visual materials and their sources. (Author/JN)

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THE "MARINATED" CLASSROOM

A SOURCEBOOK OF AQUATIC ACTIVITIES FOR THE ELEMENTARY CLASSROOM

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BY
STEVEN J. RAKOW

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THE "MARINATED" CLASSROOM

BY: STEVEN J. RAKOW

This work was supported by a grant from the Minnesota Sea Grant Program.

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UNIVERSITY OF MINNESOTA
Minneapolis, Minnesota
1982

WHAT IS "AQUATIC EDUCATION"

"Aquatic" is defined by Webster as "of or pertaining to water." In its broadest sense, then, Aquatic Education would refer to any learning activities that relate to water. However, this broad definition has the potential of being confusing. There are two types of water environments that are of interest to educators, and these two environments differ greatly in their properties and characteristics. Teachers living in coastal regions will be most concerned about the salt water environment of the oceans, estuaries and salt marshes. For this reason, the term "marine" has generally been applied to activities related to the salt water environment. This leaves educators in the midwest, concerned primarily with the study of freshwater lakes and streams, without a good term of reference to describe this specific environment. It is becoming more and more common for the term "Aquatic Education" to be applied to the study of freshwater systems. While this is not a totally accurate use of the term, it is the best term available at this time.

WHY A HANDBOOK OF AQUATIC EDUCATION

Minnesota is termed the "Land of 10,000 Lakes" so it is not surprising that Minnesota students are both interested in and experienced with water environments. However, little teaching specifically related to this uniquely Minnesotan environment is going on in the schools. A frequently heard complaint from teachers is that there are no materials available to meet their needs. This handbook is an attempt to break down that myth.

Curriculum education projects related to Marine and Aquatic Education have gone on in many parts of the country. Some of these have been school district sponsored projects and some sponsored by Title IV-C. However, the vast majority of materials designed to help teachers teach about water have come from the National Sea Grant Program. This agency, part of the Department of Commerce under the auspices of the National Oceanic and Atmospheric Administration, was created in 1966. The goals were to provide the same sort of research emphasis and support to the "water" environment as the Land Grant College Program of the 1800's had to the field of agriculture.

When the program was established, they defined the Great Lakes region as our nation's fourth coastline. This provided the means for Great Lakes states to receive financial support from the program in the areas of Fisheries and Aquaculture, Coastal and Environmental Processes, Water Safety, Recreation and, of course, Education.

HOW TO USE THIS HANDBOOK

The handbook is divided into three sections.

Part I: INTRODUCTION (First section of white pages)

This section of the handbook provides an overview of aquatic education, a description of the use of handbook, and two indices to the curriculum materials. The first index lists the curriculum materials by source with full references for requesting the materials by mail. The second index lists the curriculum materials by their Minnesota Water topic Area. Those topics, with examples are listed below.

WATER TOPICS

A. WATER AND SOCIETY

(1). Water in Our Daily Lives

e.g., water in our homes, city water supplies, transportational and recreational uses of water

(2). Water in History and as a Part of Culture

e.g., importance of water in the choice of sites for cities, importance of Lake Superior in Minnesota's cultural history

(3). The Water Quality Problem

e.g., water shortage, water pollution

B. WATER IN NATURE

(1). Nature's Water Cycle

e.g., characteristics of lakes and streams, the water cycle, the water table, water in erosion, distribution of freshwater

(2). Properties of Water

e.g., physical and chemical properties of water

(3). Life in Water

e.g., biological properties of water, water organisms

C. ATTITUDES AND EXPERIENCES

(1). Attitudes About Water

e.g., importance of protecting water supply, perceived magnitude of the water problem, value for freshwater resources

(2). Experiences With Water

e.g., field trips and vacations to lake areas, ability to swim, films and books about water

Part II: Curriculum Materials (Yellow pages)

For the purposes of this handbook, curriculum materials are defined as instructional materials providing ideas or plans for activities related to water activities. These may be complete courses of study, or they may be short collections of activities. These materials are listed alphabetically by title. In addition, an Index is given to each item so that it can be cross-referenced with the two indices in Part I. This number is composed of three parts. The first part (either CM or R) identifies the citation as referring to either Curriculum Materials or Resources. The second part (either E or S) identifies the grade level of the materials as Elementary or Secondary (both junior high and high school age). Finally the third part (a number) gives a sequential identifier to each of the materials. This might be thought of as a page number for the curriculum materials or the resources. Hence, an item with an Index of:

CM/S/25

would be a curriculum material for secondary students and would be the 25th listing in the yellow paged curriculum materials section.

Part III: Resources (Second section of white pages)

The last part of the handbook lists resources with short annotations. These resources include teacher and student references, trade books, bibliographies, pamphlets, and audio-visual materials and sources. The materials are arranged alphabetically and given an index number in the same manner as curriculum materials. Because many of these materials cover a wide range of topics, they have not been indexed by Minnesota Water Topic Areas.

NOTE: Because of the wide use of the NSF sponsored curriculum materials, SCIS (Science Curriculum Improvement Study) and ESS (Elementary Science Study) these materials have not been included in the handbook. Several of these units, however, are very applicable to aquatic education and have, in fact, served as the model for many subsequent curriculum development projects.

SECONDARY CURRICULUM MATERIALS INDEXED BY SOURCE

ALAMEDA COUNTY SCHOOLS OFFICE
685 A Street
Hayward, CA 94541

Marine Ecology Research Project -- Elementary Curriculum	CM/E/17

COAST PROJECT
Willard Hall Education Building
University of Delaware
Newark, Delaware 19711

Art and the Marine Environment	CM/E/4
The Dunes at Play	CM/E/8
Exploring a Pond	CM/E/10
Marine Aquaria	CM/E/15
Ships and Seaways	CM/E/24
Ships Through the Ages	CM/E/25
Water: Common Waste Recipient	CM/E/29
Water for Fun	CM/E/30

ERIC-SMEAC
1200 Chalmers Road
Columbus, Ohio 43212

Water-Related Teaching Activities	CM/E/31

THE GARDEN CLUB OF AMERICA
598 Madison Ave.
New York, NY 10022

The World Around You -- Environmental Education Packet	CM/E/33

JENNY PUBLISHING COMPANY
57 Queen Ave. S.
Minneapolis, MN 55405

We Can Help	CM/E/32

LANDERS CONSERVATION CENTER
Landers, Wyoming 82520

Water	CM/E/28

MICHIGAN SEA GRANT
School of Natural Resources
University of Michigan
Ann Arbor, Michigan 48109

Investigating the Great Lakes Environment--The Sea Lamprey	CM/E/12

MINNESOTA SEA GRANT EDUCATION PROJECT
c/o Dr. Eugene Gennaro
370 Peik Hall
159 Pillsbury Dr. SE
Minneapolis, MN 55455

Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Science Modules	CM/E/21

MINNESOTA SEA GRANT EXTENSION
University of Minnesota-Duluth
109 Washburn Hall
Duluth, MN 55812

Lacustrine Lessons	CM/E/14

NATIONAL WILDLIFE FEDERATION
Educational Servicing
1412 16th St., NW
Washington, DC 20036

Brine Shrimp and Their Habitat	CM/E/6
Changes in a Small Ecosystem	CM/E/7
Fish and Water Temperature	CM/E/11
Snow and Ice	CM/E/26
Stream Profiles	CM/E/27

NORTHERN NEW ENGLAND MARINE EDUCATION PROJECT (NNMEP)
206 Shibles Hall
University of Maine
Orono, Maine 04469

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
The Aquarium	CM/E/2
The Beaver	CM/E/5
Marine Art	CM/E/16

POLLUTION CONTROL EDUCATION CENTER
Union Public Schools
Union, NJ

Priority 1 Environment (1-3)	CM/E/22
Priority 1 Environment (4-6)	CM/E/23

SEA GRANT PROGRAM
Texas A and M University
College Station, Texas 77843

Investigating the Marine Environment and Its Resources	CM/E/13
Marine Organisms in Science Teaching	CM/E/18

THOMAS ALVA EDISON FOUNDATION
2000 Second Ave.
Detroit, Michigan 48226

Environmental Experiments...from Edison	CM/E/9

YOUTH COASTAL EDUCATION PROGRAM
21 S. Graove St.
East Aurora, NY 14052

Aquatic Activities for Youth	CM/E/3

ELEMENTARY CURRICULUM MATERIALS INDEXED BY MINNESOTA WATER TOPIC AREAS

A1. WATER IN OUR DAILY LIVES

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Aquatic Activities for Youth	CM/E/3
Environmental Experiments...from Edison	CM/E/9
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Ecology Research Project--Elementary Curriculum	CM/E/17
Minnesota Sea Grant -- A WAter Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Module	CM/E/20
Minnesota Sea Grant --Life Science Module	CM/E/21
Water	CM/E/28
Water-Related Teaching Activities	CM/E/31

A2. WATER IN HISTORY AND AS A PART OF CULTURE

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Aquatic Activities for Youth	CM/E/3
Investigating the Great Lakes Environment-The Sea Lamprey	CM/E/12
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Ecology Research Project--Elementary Curriculum	CM/E/17
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Module	CM/E/20
Minnesota Sea Grant -- Life Science Module	CM/E/21
Ships and Seaways	CM/E/24
Ships Through the Ages	CM/E/25
Water	CM/E/28
Water-Related TEaching Activities	CM/E/31

A3. THE WATER QUALITY PROBLEM

Brine Shrimp and Their Habitat	CM/E/6
Environmental Experiments...from Edison	CM/E/9
Fish and Water Temperature	CM/E/11
Investigating the Great Lakes Environment-The Sea Lamprey	CM/E/12
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Ecology Research Project--Elementary Curriculum	CM/E/17
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Sciences Module	CM/E/20
Minnesota Sea Grant -- Life Sciences Module	CM/E/21
Priority 1 Environment	CM/E/22
Priority 1 Environment	CM/E/23
Water	CM/E/28
Water: A Common Waste Recipient	CM/E/29
Water for Fun	CM/E/30
Water-Related Teaching Activities	CM/E/31
We Can Help	CM/E/32

B1. NATURE'S WATER CYCLE

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Environmental Experiments...from Edison	CM/E/9
Exploring a Pond	CM/E/10
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Science Modules	CM/E/21
Priority 1 Environment	CM/E/22
Priority 1 Environment	CM/E/23
Stream Profiles	CM/E/27
Water	CM/E/28
Water-Related Teaching Activities	CM/E/31
We Can Help	CM/E/32

B2. PROPERTIES OF WATER

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Aquatic Activities for Youth	CM/E/3
Investigating the Marine Environment and Its Resource	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Ecology Research Project--Elementary Curriculum	CM/E/17
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Science Modules	CM/E/21
Snow and Ice	CM/E/26
Water	CM/E/28
Water-Related Teaching Activities	CM/E/31
We Can Help	CM/E/32

B3. LIFE IN WATER

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
The Aquarium	CM/E/2
Aquatic Activities for Youth	CM/E/3
The Beaver	CM/E/5
Brine Shrimp and Their Habitat	CM/E/6
Changes in a Small Ecosystem	CM/E/7
Exploring a Pond	CM/E/10
Fish and Water Temperature	CM/E/11
Investigating the Great Lakes Environment-The Sea Lamprey	CM/E/12
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Aquaria	CM/E/15

B3. LIFE IN WATER, cont.

Marine Ecology Research Project -- Elementary Curriculum	CM/E/17
Marine Organisms in Science Teaching	CM/E/18
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Science Modules	CM/E/21
Water	CM/E/28
Water-Related Teaching Activities	CM/E/31
The World Around You--Environmental Education Packet	CM/E/33

C1. ATTITUDES ABOUT WATER

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Aquatic Activities for Youth	CM/E/3
Art and the Marine Environment	CM/E/4
The Dunes at Play	CM/E/8
Exploring a Pond	CM/E/10
Investigating the Great Lakes Environment-The Sea Lamprey	CM/E/12
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Science Modules	CM/E/21
Priority 1 Environment (1-3)	CM/E/22
Priority 1 Environment (4-6)	CM/E/23
Water	CM/E/28
Water for Fun	CM/E/30
Water-Related Teaching Activities	CM/E/31
We Can Help	CM/E/32

C2. EXPERIENCES WITH WATER

The ABC's of Celebrating the Year of the Coast in Your School	CM/E/1
Aquatic Activities for Youth	CM/E/3
Art and the Marine Environment	CM/E/4
The Dunes at Play	CM/E/8
Exploring a Pond	CM/E/10
Investigating the Marine Environment and Its Resources	CM/E/13
Lacustrine Lessons	CM/E/14
Marine Art	CM/E/16
Minnesota Sea Grant -- A Water Primer	CM/E/19
Minnesota Sea Grant -- Earth Science Modules	CM/E/20
Minnesota Sea Grant -- Life Scienc Modules	CM/E/21
Snow and Ice	CM/E/26
Stream Profiles	CM/E/27
Water	CM/E/28
Water for Fun	CM/E/30
Water-Related Teaching Activities	CM/E/31
We Can Help	CM/E/32

CURRICULUM MATERIALS

Index: CM/E/1

NAME: The ABC's of Celebrating Year of the Coast in Your School

SOURCE: NNMEP (Northern New England Marine Education Project)

PRICE: $2.00 + $1.50 handling

GRADE LEVEL: K-12

SUBJECT AREA(S): Various

MINNESOTA WATER TOPICS (A1) (A2) A3 (B1) (B2) (B3) (C1) (C2)

TOPICS:

STUDENT PREREQUISITES:

TEACHER BACKGROUND INFORMATION PROVIDED: YES NO

TIME REQUIRED:

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) GAMES/SIMULATIONS

(READINGS) (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) (EVALUATION MATERIALS)

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: The unit is a collection of ideas for learning about the marine environment. An excellent resource.

Index: CM/E/2

NAME: The Aquarium

SOURCE: Northern New England Marine Education Project

PRICE: $2.00 + $1.50 handling

GRADE LEVEL: 2

SUBJECT AREA(S): Literature, math, art, science

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS: building an aquarium, language arts, art activities, math activities, science readings

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 6 periods (variable)

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Good variety of activities with a minimal of preparation.

Index: CM/E/3

NAME: Aquatic Activities for Youth

SOURCE: Youth Coastal Education Program

PRICE: 9 units x 35¢ each

GRADE LEVEL: 4-9

SUBJECT AREA(S): Science, Social Studies

MINNESOTA WATER TOPICS (A1) (A2) A3 B1 (B2) (B3) (C1) (C2)

TOPICS: Introduction; 1-Fish Aquariums; 2-Raising Earthworms; 3-Entomology and Water; 4-Rope; 5-Calculating Stream Flow; 6-Cobbler's Cove; 7-A Saltwater World in a Jar; 8-Fish in Your Diet

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	(GAMES/SIMULATIONS)
READINGS	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Units were originally designed for 4-H and scouting groups. Material easy to obtain except for some which are specific to the marine environment.

Index: CM/E/4

NAME: Art and the Marine Environment

SOURCE: COAST

PRICE: $1.00

GRADE LEVEL: K-6

SUBJECT AREA(S): Art

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 B3 C1 C2

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES NO

TIME REQUIRED: Various

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
LAB ACTIVITIES	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES YES NO

RESOURCES/REFERENCES CITED YES NO

COMMENTS:

Index: CM/E/5

NAME: The Beaver

SOURCE: Northern New England Marine Education Project

PRICE: $2.00 + $1.50 handling

GRADE LEVEL: 3

SUBJECT AREA(S): Science, language arts, art, music, math

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS: Life cycle of beaver

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 5-15

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) GAMES/SIMULATIONS

(READINGS) DISCUSSION QUESTIONS

(LAB ACTIVITIES) (EVALUATION MATERIALS)

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

(OTHER) Math Problems

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: "This could be incorporated easily into different aspects of the curriculum." "I don't think that you would want to spend all year on the beaver."

Index: CM/E/6

NAME: Brine Shrimp and Their Habitat

SOURCE: National Wildlife Federation

PRICE: $1.50

GRADE LEVEL: 1-5

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 (A3) B1 B2 (B3) C1 C2

TOPICS: Brine shrimp hatching, effect of the environment on brine shrimp

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 5 class periods

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) GAMES/SIMULATIONS

READINGS (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

Teacher and students list

COMMENTS:

"Highly motivating"

"Lot's of information and suggested activities"

Index: CM/E/7

NAME: Changes in a Small Ecosystem

SOURCE: National Wildlife Federation

PRICE: $1.50

GRADE LEVEL: 5-9

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS: Field trip, classroom observation, sampling

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 21 days (minimal observation each day)

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) GAMES/SIMULATIONS

READINGS (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Materials common and easily obtained. Many open-ended activities. "Lots of inquiry." "We have ammy places where students can apply these activities."

Index: CM/E/8

NAME: The Dunes at Play

SOURCE: COAST

PRICE: $1.85

GRADE LEVEL: 1-3

SUBJECT AREA(S): Science, Drama

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 B3 (C1) (C2)

TOPICS: A dramatic portrayal of dunes.

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 2 periods

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
LAB ACTIVITIES	(EVALUATION MATERIALS)
LAB EQUIPMENT AVAILABLE	(AUDIO VISUAL MATERIALS)
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/9

NAME: Environmental Experiments... from Edison

SOURCE: Thomas Alva Edison Foundation

PRICE:

GRADE LEVEL: 4-9

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS (A1) A2 (A3) (B1) B2 B3 C1 C2

TOPICS: Water from Plants; A Model Water Filter; Water Holding capacity of Soil

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 1 class period

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS: Easily obtained materials

Index: CM/E/10

NAME: Exploring a Pond

SOURCE: COAST

PRICE: 75¢

GRADE LEVEL: 3-4

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 A3 (B1) B2 (B3) (C1) (C2)

TOPICS:

STUDENT PREREQUISITES:

TEACHER BACKGROUND INFORMATION PROVIDED: YES NO

TIME REQUIRED: Various

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	(EVALUATION MATERIALS)
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: C*/E/11

NAME: Fish and Water Temperature

SOURCE: National Wildlife Federation

PRICE: $1.50

GRADE LEVEL: 4-9

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 (A3) B1 B2 (B3) C1 C2

TOPICS: Thermal pollution, behavior of fish

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 4-5 days

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO
Teacher and student lists

COMMENTS: Materials easily obtained.

Index: CM/E/12

NAME: Investigating the Great Lakes Environment - The Sea Lamprey Story

SOURCE: Michigan Sea Grants

PRICE: $37.50 (186 pages and film strip)

GRADE LEVEL: 6-8

SUBJECT AREA(S): Science, Social Studies

MINNESOTA WATER TOPICS A1 (A2) (A3) B1 B2 (B3) (C1) C2

TOPICS: The Sea Lamprey (life cycle, history, control)

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Varies from 1 period for some activities to 14 periods for the whole unit.

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) (GAMES/SIMULATIONS)

(READINGS) (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) (EVALUATION MATERIALS)

LAB EQUIPMENT AVAILABLE (AUDIO VISUAL MATERIALS)

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: A comprehensive approach to a single environmental issue utilizing a variety of techniques. "Reading level rooms high for 7-8 graders." "Even though we are not right on the Great Lakes in Mpls/St. Paul, it's important to stress the interrelationships of animals, especially when a foreign organism is introduced into a new environment." "Materials are too indepth."

Index: CM/E/13

NAME: Investigating the Marine Environment and Its Resources

SOURCE: Sea Grant College Program/Texas A & M University

PRICE: $8.00 (500 pages)

GRADE LEVEL: 4-9

SUBJECT AREA(S): Science, Social Studies, Language, Art

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS: Extremely comprehensive and varied.

STUDENT PREREQUISITES: Variable

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED:

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) (GAMES/SIMULATIONS)

(READINGS) (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: The single most comprehensive collection of marine activities available.

Index: CM/E/14

NAME: Lacustrine Lessons

SOURCE: Minnesota Sea Grant - Extension

PRICE: Free

GRADE LEVEL: K-12

SUBJECT AREA(S): Science, Social Studies

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS: Variety including Freshwater Aquaria, Turn-over, Gyotaku, Building a Coastal City, Acid Rain

STUDENT PREREQUISITES: Varies

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Generally 1-2 class periods per activity

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) (GAMES/SIMULATIONS)

READINGS (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: A periodic newsletter published by Minnesota Sea Grant listing aquatic activities.

Index: CM/E/15

NAME: Marine Aquaria

SOURCE: COAST

PRICE: 50¢

GRADE LEVEL: K-12

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	(EVALUATION MATERIALS)
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/16

NAME: Marine Art

SOURCE: Northern New England Marine Education Project

PRICE: $2.00 + $1.50 handling

GRADE LEVEL: K-1

SUBJECT AREA(S): Art

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 B3 C1 (C2)

TOPICS: Art activities related to underwater life, shells, rocks and pebbles and driftwood, vegetation and beach grass.

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Some marine materials would be difficult to obtain in Minnesota.

Index: CM/E/17

NAME: Marine Ecology Research Project - Elementary Curriculum

SOURCE: Alameda County Schools

PRICE: $7.50

GRADE LEVEL: K-6

SUBJECT AREA(S): Science, language arts

MINNESOTA WATER TOPICS (A1) (A2) (A3) B1 (B2) (B3) C1 C2

TOPICS: Sea Water; Waves; Tides and Currents; Life in the Sea; Marine Environment; Man and the Sea

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED: Year Curriculum (variable time for individual activities)

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) (GAMES/SIMULATIONS)

(READINGS) (DISCUSSION QUESTIONS)

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Most activities are exclusively marine in focus but some could be adapted to the freshwater environment.

Index: CM/E/18

NAME: Marine Organisms in Science Teaching

SOURCE: Sea Grant College Program, Texas A & M University

PRICE: $4.00 (192 pages)

GRADE LEVEL: 4-12

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS: Marine organisms

STUDENT PREREQUISITES: Variable (from none to basic biology)

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)
Only minimal background given

TIME REQUIRED: Varable depending on activity (most activities designed for 1-2 periods)

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Each unit uses the format: Pre Lab, Lab, Post Lab. Some organisms (brine shrimp) easily available to MN teachers. Others (e.g. sea amenione's) could be ordered. A list of suppliers is given.

Index: CM/E/19

NAME: Minnesota Sea Grant - A Water Primes

SOURCE: Minnesota Sea Grant Education Project

PRICE: Free

GRADE LEVEL: 5-8

SUBJECT AREA(S): Science/Social Studies

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS: Water Properties; Water Pollution; Acids and Bases; Acid Precipitation

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Open-ended activities providing a background knowledge for the study of water pollution.

Index: CM/E/20

NAME: Minnesota Sea Grant Earth Science Modules

SOURCE: Minnesota Sea Grant Ed. Project

PRICE: Free

GRADE LEVEL: 5-8

SUBJECT AREA(S): Science/Social Studies

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) B3 (C1) (C2)

TOPICS: The Water Cycle; Minnesota's Glacial Past; Acids and Rocks; Stream Tables

STUDENT PREREQUISITES: Basic knowledge of acids

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/21

NAME: Minnesota Sea Grant - Life Science Modules

SOURCE: Minn Sea Grant Ed Project

PRICE: Free

GRADE LEVEL: 5-8

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS: A Model Ecosystem; Food Chains; Acids and Brine Shrimp; A Field Trip Guide

STUDENT PREREQUISITES: Basic knowledge of Acids

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/22

NAME: Priority 1 Environment

SOURCE: Pollution Control Education Center

PRICE: Teacher's Guide $2.00

GRADE LEVEL: 1-3

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 (A3) (B1) B2 B3 (C1) C2

TOPICS: Earth as a Spaceship; Pollution; Clean Air and Water, Air Pollution; Cleaning Water; Solid Waste, Environment; Population; Recycling

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 5-10 class periods

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
(LAB EQUIPMENT AVAILABLE)	(AUDIO VISUAL MATERIALS)

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS:

Index: CM/E/23

NAME: Priority 1 Environment

SOURCE: Pollution Control Education Center

PRICE: Teacher's Guide $5.00

GRADE LEVEL: 4-6

SUBJECT AREA(S): Science

MINNESOTA WATER TOPICS A1 A2 (A3) (B1) B2 B3 (C1) C2

TOPICS: Air Pollution; Water Pollution; Thermal Water Pollution; Solid Wate Management; The Great Swamp; Marine and Seashore Pollution

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 5-10 classes

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	(EVALUATION MATERIALS)
(LAB EQUIPMENT AVAILABLE)	(AUDIO VISUAL MATERIALS)

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS:

Index: CM/E/24

NAME: Ships and Seaways

SOURCE: COAST

PRICE: $5.00

GRADE LEVEL: K-5

SUBJECT AREA(S): Social Studies, Language Arts

MINNESOTA WATER TOPICS A1 (A2) A3 B1 B2 B3 C1 C2

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED: 5 periods

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS) GAMES/SIMULATIONS

(READINGS) DISCUSSION QUESTIONS

(LAB ACTIVITIES) EVALUATION MATERIALS

LAB EQUIPMENT AVAILABLE (AUDIO VISUAL MATERIALS)

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/25

NAME: Ships through the Ages

SOURCE: COAST

PRICE: $1.35

GRADE LEVEL: 3-6

SUBJECT AREA(S): Social Studies, Language Arts

MINNESOTA WATER TOPICS A1 (A2) A3 B1 B2 B3 C1 C2

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
LAB ACTIVITIES	(EVALUATION MATERIALS)
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/26

NAME: Snow and Ice

SOURCE: National Wildlife Federation

PRICE: $1.50

GRADE LEVEL: 1-6

SUBJECT AREA(S): Science, Art

MINNESOTA WATER TOPICS A1 A2 A3 B1 (B2) B3 C1 (C2)

TOPICS: Properties of snow and ice, art with snow, tracking animals in snow.

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 1 class to several weeks

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS: Variety activies to learn about and have fun in show. "Lots of inquiry activities." "Adaptabity of a variety of ideas."

Index: CM/E/27

NAME: Stream Profiles

SOURCE: The National Wildlife Federation

PRICE: $1.00

GRADE LEVEL: 4-9

SUBJECT AREA(S): Science, Math

MINNESOTA WATER TOPICS A1 A2 A3 (B1) B2 B3 C1 (C2)

TOPICS: Survey of a stream

STUDENT PREREQUISITES: Basic mathematics skills

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 4-5 class periods

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	GAMES/SIMULATIONS
READINGS	(DISCUSSION QUESTIONS)
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES (YES) NO

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS: Materials easily obtained. High degree of student involvement.

Index: CM/E/28

NAME: Water

SOURCE: Landers Conservation Center

PRICE:

GRADE LEVEL: K-6

SUBJECT AREA(S): Science, Social Studies, Language

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: YES (NO)

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS: 79 individual activities. Very openended. Requires students to develop method.

Index: CM/E/29

NAME: Water: Common Waste Recipient

SOURCE: COAST

PRICE: 80¢

GRADE LEVEL: 4-5

SUBJECT AREA(S): Reading

MINNESOTA WATER TOPICS A1 A2 (A3) B1 B2 B3 C1 C2

TOPICS: Waste Disposal

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 1 period

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
LAB ACTIVITIES	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/30

NAME: Water for Fun

SOURCE: COAST

PRICE: 95¢

GRADE LEVEL: K-4

SUBJECT AREA(S): Science, Social Studies, Language Arts

MINNESOTA WATER TOPICS A1 A2 (A3) B1 B2 B3 (C1) (C2)

TOPICS:

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: 1-2 periods

MATERIALS PROVIDED WITH THE UNIT

(WORKSHEETS)	(GAMES/SIMULATIONS)
READINGS	DISCUSSION QUESTIONS
LAB ACTIVITIES	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
OTHER _____	

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED (YES) NO

COMMENTS:

Index: CM/E/31

NAME: Water-Related Teaching Activities

SOURCE: ERIC-SMEAC

PRICE:

GRADE LEVEL:K-12

SUBJECT AREA(S): Science, Math, Social Studies, Art, Language Art, Music

MINNESOTA WATER TOPICS (A1) (A2) (A3) (B1) (B2) (B3) (C1) (C2)

TOPICS: Collection of activities appearing in ERIC documents

STUDENT PREREQUISITES:

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO
Minimal

TIME REQUIRED: Generally 1 period per activity

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	(GAMES/SIMULATIONS)
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	(EVALUATION MATERIALS)
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS: Excellent collection of a variety of activities.

Index: CM/E/32

NAME: We Can Help: U.S. Fish and Wildlife Service

SOURCE: U.S. Fish and Wildlife Service

PRICE: $20 for 24 units + $1.00 postage

GRADE LEVEL: Level I (4-6) Level II (7-12)

SUBJECT AREA(S): Science, Social Studies

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 B3 C1 C2

TOPICS: Examples are: Water Flow and Impoundment; Snow; Fish Hatcheries; Water quality Analysis; Waterfowl Nest Structures; Wetlands and Wildlife; Fish Populations

STUDENT PREREQUISITES: Variable

TEACHER BACKGROUND INFORMATION PROVIDED: YES NO

TIME REQUIRED: 1 Day for each unit

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
READINGS	DISCUSSION QUESTIONS
LAB ACTIVITIES	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS

OTHER _____

EXTENSIONS OR RELATED ACTIVITIES YES NO

RESOURCES/REFERENCES CITED YES NO

COMMENTS: The focus is specifically on outdoor education. Good supplement to an environmental field trip.

Index: CM/E/33

NAME: The World Around You - Environmental Education Packet

SOURCE: The Garden Club of America

PRICE: Free

GRADE LEVEL: 6-9

SUBJECT AREA(S): Science, Social Studies

MINNESOTA WATER TOPICS A1 A2 A3 B1 B2 (B3) C1 C2

TOPICS: General topics in environmental education

STUDENT PREREQUISITES: None

TEACHER BACKGROUND INFORMATION PROVIDED: (YES) NO

TIME REQUIRED: Variable

MATERIALS PROVIDED WITH THE UNIT

WORKSHEETS	GAMES/SIMULATIONS
(READINGS)	DISCUSSION QUESTIONS
(LAB ACTIVITIES)	EVALUATION MATERIALS
LAB EQUIPMENT AVAILABLE	AUDIO VISUAL MATERIALS
(OTHER) Posters	

EXTENSIONS OR RELATED ACTIVITIES YES (NO)

RESOURCES/REFERENCES CITED YES (NO)

COMMENTS:

RESOURCES

R/E/1
EARLY LOGGERS IN MINNESOTA - VOL. II
J. C. Ryan
Minnesota Timber Producers Association
200 Christie Building
Duluth, MN 55802 1976

A book filled with pictures that tell the story of logging themselves. A teacher could read excerpts from the script, which is rich with descriptions of the lumberjacks lives, to help students increase their awareness of the early lumber industry.

R/E/2
EDUCATORS' GUIDE TO GREAT LAKES MATERIALS
Pam Johnson
University of Wisconsin Sea Grant College Programs
Sea Grant Communications Office
1800 University Ave.
Madison, WI 53706

A bibliography of contemporary materials on many aspects of the Great Lakes which will aid educators in locating appropriate books, maps, charts, pamphlets, and films for classroom use.

R/E/3
ENVIRONMENTAL EDUCATION - GUIDELINES AND ACTIVITIES FOR TEACHERS
S. Andean Allman, O. W. Koop, and David L. Zufelt
Charles E. Merrill Publishing Co.
Columbus, Ohio 43216

Some education incounters directly related to water pollution and conservation. A good resource book to get started, but lacks detail info needed for student activities, but a list of concepts and related encounters is listed at the beginning of the book.

R/E/4
ENVIRONMENTAL EDUCATION REPORT - POLLUTION
Center for Environmental Education, Inc.
Suite 206
1925 K Street N.W.
Washington, DC 20006

This volume contains several articles on Acid Rain and has a section for A-V resources and suggested children's and resource books.

R/E/5
FRIENDS OF THE BOUNDARY WATERS WILDERNESS
1783 Lindig Street
St. Paul, MN 55113

This publication summaries the history of the battle for protective legislation for the Boundary Waters. It includes a map of the area and a list of the provisions of the Boundary Waters Canoe Area Wilderness Act.

R/E/6
A GEOLOGIC FIELD TRIP ACROSS MINNESOTA
Donald A. Johnson, and David L. Williams
Minnesota Field Trip
P.O. Box 1582
St. Cloud, MN 56301

Two MN earth science teachers developed this guide for students to take a geologic field trip across their own state via cartoons, photographs, slides and written explanations. It would enhance an earth science classroom motivating interest in students and making geology more relative to them.

R/E/7
GOPHER HISTORIAN
Minnesota Historical Society
Cedar and Central
St. Paul, MN 55101

A periodical publication of the Minnesota Historical Society on topics of interest related to Minnesota History.

R/E/8
THE GREAT LAKES
Hawkhill Associates, Inc.
125 E. Gillman St.
Madison, WR 53703

A look at the geology, history, and ecology of the Great Lakes in a series of three sound-filmstrips:

(1) "Romance of the Lumberjack" Using photographs, folk songs, and script, this sound-filmstrip portrays the "romance" and the incredibly rigorous, hard life of lumbering during the 19th Century in Michigan, Minnesota and Wisconsin.

(2) "Wilderness by Canoe" An historic journey through the Boundary Waters Canoe Area and Quetico Provicial Park describing the days of the fur trade boom and the effects of mining and lumbering in the region.

(3) "Iron Mines & Men" The story of iron mining yesterday and today in Michigan, Minnesota, and Wisconsin is told through photos and color shots. The viewer will be taken from the discovery of iron ore to the present day methods of mining.

R/E/9
THE GREAT LAKES REGION IN CHILDREN'S BOOKS
edited by Donna Taylor
Green Oak Press
Brighton, Michigan 1980

An annotated guide to works about the Great Lakes region including hard and soft cover books, pamphlets, and magazines. Very useful when locating materials about the Great Lakes, especially because it is divided by books about each state in this region. There are several indices which further aid in finding appropriate materials.

R/E/10
GUIDE TO THE MARINE EDUCATION SYSTEM
Susan C. Gammusib and James A. Lanier
SEA Grant Program
Virginia Institute of Marine Science
Oboucester Point, Virginia 23062

This book consists of an explanation of the Marine Educational Materials System (MEMS) and how to use it, an ongoing list of the publications which have been entered, an index of descriptors and listings of entries by author and grade level. Using the index of descriptors, it is possible to conduct a manual cross-referenced search of MEMS entries. A centralized source of information on marine education, the MEMS provides computer access to a broad range of materials useful in adding marine emphasis at any level with freshwater curriculm, laboratory guides, and field guides included.

R/E/11
PADDLE -TO-THE SEA
Holling Claucy Holling
Houghton Mifflin Company
Boston, MA 1941 & 1969

The story of a young Indian boy's carved canoe as a travel through the Great Lakes to the sea.

R/E/12
PIONEER FACES AND PLACES
Cook County Historical Society
Arrowhead Printing
Superior, WI 1979

This book contains a collection of photographs which help explain the lives, hardships and tails of the pioneers in the Arrowhead Region of Lake Superior. Brief descriptions are given for each picture, but otherwise there is little script. Students can find out a great deal about the hopes and heartbreaks of the pioneers by just viewing the photos.

R/E/13
TRANS - MISSISSIPPI BIOLOGICAL SUPPLY
Jerry Hawkins
550 Cardigan Road
St. Paul, MN 55112

R/E/14
THE VOYAGEURS AND THEIR SONGS
Theodore C. Blegan
Minnesota Historical Society
St. Paul, MN 1966

This pamphlet contains a vivid description of the lives of voyageurs in the Great Lakes Region. It would be an excellent resource for depicting the history and for capturing the flavor of our heritage in song. An interesting account that could be read by the teacher to the class.

R/E/15
WATER - EXPERIMENTS TO UNDERSTAND IT
Boris Arnov
Lothrop, Lec & Shepard Books
William Morrow & Co., Inc.
105 Madison Ave.
New York, NY 10016

Properties of water are demonstrated through simple experiments. Cookbook approach, little room for child's creativity, somewhat uninteresting because of this approach. Good teacher reference on experiments on chemical and physical properties of water.

R/E/16
WHEN ALL THE CLEAN WATER IS GONE
Kathleen Branell and Linda Watson
Minnesota Department of Natural Resources
Centennial Office Building
St. Paul, MN 55101

A colorful, appealing pamphlet that could be used at several grade levels as a starting point for discussing the political, economical, and esthetic problems associated with water pollution.